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Feasibility of Breast Radiation Therapy Video Education Combined With Standard Radiation Therapy Education for Patients With Breast Cancer

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OBJECTIVES: To determine the feasibility of incorporating a brief animated educational video shown during the radiation therapy (RT) consultation appointment for patients with breast cancer and to collect preliminary quality-of-life data.

SAMPLE & SETTING: 20 participants with breast cancer were recruited from an outpatient radiation oncology facility in the southeastern United States.

METHODS & VARIABLES: This single-arm, pre- and post-test feasibility study aimed to assess feasibility and preliminary outcomes of patient-reported anxiety, distress, and RT concerns.

RESULTS: The video intervention demonstrated feasibility, as evidenced by meeting or exceeding benchmarks set for recruitment, retention, and feasibility measured scores. The difference in means of total patient-reported scores comparing pre- to postintervention decreased.

IMPLICATIONS FOR NURSING: The intervention proved feasible. In addition, the decrease in total mean scores suggests the video may have a positive effect on reducing patient distress, anxiety, and RT concerns.

KEYWORDS radiation therapy; breast cancer; quality of life; anxiety; information needs
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Breast cancer is one of the most common cancers in the United States, with more than 270,000 new cases estimated to be diagnosed in 2020 (American Cancer Society, 2020; Bluethmann et al., 2016; Miller et al., 2016). Radiation therapy (RT) for breast cancer is recommended as part of multimodality therapy and most often occurs after surgery and systemic therapy, signaling the end to a long course of treatment (6–18 months) (Kole et al., 2017). Potential side effects of radiation include dermatologic changes in the treatment field, an increase in patient fatigue, and a continuum of psychological concerns, such as body image and fear of recurrence (Halkett et al., 2009, 2012; Hess & Chen, 2014; Kole et al., 2017). Patients with breast cancer may not be adequately prepared for RT, and studies have reported high RT information needs for women with breast cancer (Geinitz et al., 2012; Harrison et al., 1999). In addition, previous studies have demonstrated a high prevalence of anxiety for patients with breast cancer prior to undergoing RT (Halkett et al., 2008, 2009; Hess & Chen, 2014; Reinhart et al., 2014). Contributing to this anxiety is a lack of knowledge or understanding of the benefits and side effects of RT, as well as fear of the RT planning process and delivery of RT (Halkett et al., 2008; Hess & Chen, 2014; Pembroke et al., 2020; Reinhart et al., 2014). Therefore, addressing the information needs of patients with breast cancer prior to initiation of RT is vital to reducing stress (e.g., anxiety), enhancing the treatment experience, potentially increasing adherence to the regimen of RT, and improving quality of life (Halkett et al., 2009, 2012).

State of Radiation Therapy Education

Previous educational efforts have had limitations regarding modality and timing of delivery. Most RT educational programs are delivered after the first radiation oncology visit, allowing for a time in which anxiety may exist unabated (Halkett et al., 2008, 2018; Hess & Chen, 2014; Jahraus et al., 2002).

Education related to cancer treatment can be found in print materials, discussed with healthcare providers, or acquired through Internet searches (e.g., articles, videos, mobile applications) and is variable based on institutional practices. To prepare for RT, many oncology practices have explored different methods to inform and educate their patient population. Studies conducted with patients treated for breast cancer reported that written and verbal RT education did not fully prepare them for the RT experience and recommended using video or pictures to improve patient education (Hahn et al., 2005; Jahraus et al., 2002). Many existing RT educational videos for adults diagnosed with cancer portray medical professionals talking about the RT experience, images of treatment rooms, and patient testimonies. Several studies have examined the efficacy of incorporating video educational programs after the initial RT consultation (Halkett et al., 2008; Hess & Chen, 2014; Jahraus et al., 2002); however, this timing does not address the anxiety felt by patients prior to the RT consultation. The RT Prepare intervention (Halkett et al., 2018) used radiation therapists who conducted patient educational sessions prior to RT planning and again on the first day of treatment. Although the study showed promising data on reduction in patient-reported distress and concerns, costs associated with a radiation therapist–led intervention may prevent implementation at many institutions.

A gap in research exists addressing the delivery of patient education during times of high patient anxiety for patients with cancer receiving RT. The purpose of this study was to determine the feasibility of future effectiveness research on administering patient education through an animated video during the RT consultation.

Methods

This pilot feasibility study used a single-arm interventional, pre- and post-test design (a) to determine the feasibility of incorporating a brief animated educational video shown during the RT consultation appointment and (b) to collect patient-reported quality-of-life data after a video intervention. Feasibility typology reported by Tickle-Degnen (2013) and Thabane et al. (2010) was used to collect feasibility data and included information on process (participant recruitment and retention, patient adherence to questionnaires and viewing the video in its entirety), resources (use of electronics for viewing the video, paper questionnaires, availability of staff, alterations to time spent on consultation visit), management (data entry, proper administration of pre- and postintervention questionnaires), and scientific basis (preliminary data on patient-reported anxiety, distress, and concerns about RT). Approval to conduct the study was granted by the institutional review board (IRB) at the University of Florida in Gainesville (IRB #201901467).

Theoretical Framework

The Quality of Life Model Applied to Breast Cancer (Ferrell et al., 1998) was used to guide the video content of this feasibility study. This comprehensive model incorporates the following four categories of patient well-being: physical (e.g., symptoms, side effects), psychological (e.g., anxiety/depression, distress of treatment), social (e.g., support, employment, isolation), and spiritual (e.g., hopefulness, uncertainty). The relationship among all four categories, individually or combined, contributes to the overall well-being of the patient and proved to be a strong resource during video content development.

Sample and Setting

Participants in this study were recruited from the University of Florida Health Proton Therapy Institute and the University of Florida radiation oncology group in Jacksonville. A convenience sampling method was used to recruit participants during July and August of 2019. Each eligible patient considering RT for breast cancer was approached during this two-month recruitment time frame. Inclusion criteria included English-speaking men and women with a nonmetastatic breast cancer diagnosis who were referred to the study site for an initial RT consultation or a reevaluation clinic visit. The reevaluation visit typically is scheduled two to six months after the initial consultation and immediately prior to treatment planning, during which the interval medical history is updated and the RT treatment plan is confirmed. Exclusion criteria included previous treatment with RT (of any anatomic location), seeking of treatment for recurrent or metastatic breast cancer, and inability to understand and sign the informed consent. The rationale for excluding patients with a previous history of receiving RT was an inability to determine baseline knowledge

and memory of previous RT experiences, potentially rendering less impact from the educational video. The rationale for excluding patients with metastatic disease was to avoid the need to address complex medical and psychological concerns during this initial feasibility study.

A power analysis was not conducted because of the core focus of feasibility studies and the answering of the question, "Can this intervention be carried out?" prior to further investment of time and resources (Bowen et al., 2009; Leon et al., 2011; Tickle-Degnen, 2013). A pragmatic sample size of 20 participants was based on first-quarter 2019 data of breast cancer consultations (n = 29) and reevaluations (n = 14) at the study site.

Procedures

Screening of eligible participants was conducted by the principal investigator (PI) (M.P.) through chart review to ensure adherence to inclusion and exclusion criteria prior to the patient's RT appointment. When patients arrived for their scheduled clinic visits, the PI explained the study, allowed time for participant questions, and obtained written informed consent prior to initiation of the study. After informed consent was obtained, the preintervention questionnaires were administered (RT Concerns Scale, PROMIS® [Patient-Reported Outcomes Measurement Information System] Emotional Distress-Anxiety–Short Form 6a, and National Comprehensive Cancer Network [NCCN] Distress Thermometer). After baseline questionnaires were completed, the nurse case manager conducted the nursing portion of the appointment, the video was uploaded on a tablet computer for participant viewing, and each participant was provided with standard-of-care verbal and written education for RT. The postintervention questionnaires were then administered (RT Concerns Scale, PROMIS Emotional Distress-Anxiety–Short Form 6a, and NCCN Distress Thermometer), which also included five open-ended questions that assessed satisfaction and critique of the video, including likes, dislikes, and suggestions for added information. After the postintervention questionnaires were completed, the radiation oncologist completed the remaining portion of the consultation visit and allowed time for participant questions.

Intervention

The design of the video used an animated question and answer–based approach, in which an animated nurse responds to five common questions concerning RT for patients diagnosed with breast cancer. Favorable results in knowledge acquisition have been reported regarding the use of animation for patient education in areas of opioid use and colorectal cancer screening in adults (Chakravarthy et al., 2018; Meppelink et al., 2015). The script was informed by five questions that were findings from a formative qualitative study conducted with patients with breast cancer at the current study site (Pembroke et al., 2020) and the professional experiences of the PI and the radiation oncologist leading the breast cancer program at the study site (J.B.). Content focused on common questions asked before and during RT (Dunn et al., 2004; Halkett et al., 2009, 2012). The five questions were as follows:

- How do I prepare for radiation treatment?
- What are common side effects?
- Will I need to change my activities?
- Am I radioactive?
- What is treatment like?

The animated video was created by the PI using the online video creator program Powtoon and the audio-recording program Audacity®. The video lasted 7.5 minutes and informed patients about simulation, RT mechanics, and RT side effects while also dispelling myths about RT. The script was developed at the seventh grade level according to the Flesch-Kincaid Grade Level and Flesch Reading Ease tests, calculated by Microsoft® Word.

Input to the video content was sought from three radiation oncologists treating patients with breast cancer in the practice prior to finalizing the video and resulted in minor revisions prior to recruitment. This was a pragmatic exercise meant to solicit internal approval and adapt to the culture at the research site.

Measures

Key demographic variables collected in this study included sex, age, race/ethnicity, type of appointment (initial consultation or reevaluation), breast cancer stage at time of appointment, previous breast surgery, previous systemic therapy for breast cancer (chemotherapy, hormonal therapy, or immunotherapy), and documented previous history of anxiety or depression.

Feasibility: Recruitment and retention goals were set at enrollment of 80% of invited candidates, a 95% retention rate, and participants' complete viewing of the entire video. Additional feasibility outcomes were measured by two of the radiation oncologists treating patients with breast cancer using the Acceptability

of Intervention Measure (AIM), Intervention Appropriateness Measure (IAM), and Feasibility of Intervention Measure (FIM) (Weiner et al., 2017). Each survey consists of four Likert-style questions, and answers range from 1 (completely disagree) to 5 (completely agree). A total score of 4 on each measure signifies poor acceptability, appropriateness, and feasibility of the video intervention, whereas a score of 20 on each measure signifies successful implementation. Significance levels have not been established; however, higher scores indicate a higher level of acceptability, appropriateness, and feasibility. The three measures have demonstrated validity for acceptability (α = 0.85), appropriateness (α = 0.91), and feasibility (α = 0.89), as well as high test–retest reliability for acceptability (α = 0.83), appropriateness (α = 0.87), and feasibility (α = 0.88). Feasibility benchmarks for success were set at a total score of 17 of 20 (85%) for each of the AIM, IAM, and FIM survey measures.

Feasibility analysis was aided by common components of pilot study interpretation criteria, including process (number of patients approached for the study, number of patients who refused to participate, reason for refusal), resources (technical issues when operating the tablets, technical issues during video airing, time delays due to technical challenges), management (time delays in clinic flow, increase in time used during consultation visit, data entry obstacles), and scientific assessment (analysis of pre- and post-scores on instruments used, qualitative comments from participants).

Patient-reported outcomes: Preliminary outcome data on patient-reported anxiety, distress, and RT concerns were measured by the RT Concerns Scale, PROMIS Emotional Distress-Anxiety–Short Form 6a, and NCCN Distress Thermometer, administered to participants prior to and after viewing the animated video. The three instruments chosen for this study directly correlate to RT concerns or anxiety/distress. To the authors' knowledge, the instruments chosen have not been used together in a feasibility study to collect preliminary quality-of-life data on a breast cancer educational video intervention prior to RT.

The RT Concerns Scale developed by Halkett and Kristjanson (2007) was designed specifically to assess patient concerns related to RT. This instrument has a high internal consistency (Cronbach's alpha = 0.86) with acceptable stability over time ($\bar{X}$ intraclass correlation = 0.55, standard deviation [SD] = 0.18) and consists of nine items on a nine-point Likert-type scale that rates the level of concern for each question from 1 (least concerned) to 9 (most concerned). A total score of 9 signifies that concerns related to RT are low, and a total score of 81 signifies that concerns are high. The instrument is easy to use and can be completed within 10 minutes. If any participant was uncomfortable answering any question, a "not applicable" option was available.

The PROMIS Emotional Distress-Anxiety–Short Form 6a consists of six questions with five answer choices ranging from 1 (never) to 5 (always). The minimum total raw score of 6 (T-score = 39.1) signifies no reported anxiety, and a maximum total raw score of 30 (T-score = 82.5) indicates the greatest reported anxiety. Results are reported using item response theory, with U.S. citizens who participated in the 2000 general census as the reference population (HealthMeasures, n.d.). This instrument has a mean of 50 and an SD of 10, meaning that a total T-score of 60 is 1 SD above, or worse than, the reference population. A minimal clinically important difference (MCID) for the PROMIS score is calculated at a range of 3 to 4.5 points (Yost et al., 2011). This PROMIS measure has been validated with many chronic conditions such as chronic heart failure, chronic obstructive pulmonary disease, rheumatoid arthritis, cancer, back pain, and major depression (Pilkonis et al., 2011).

The NCCN Distress Thermometer, which is used extensively in the ambulatory care setting with patients with cancer, asked patients to report their level of anxiety about RT on a scale from 0 (no anxiety) to 10 (highest anxiety).

Qualitative data were also collected to assess patients' likeability of the content and format, as well as ease of use of viewing the video on the tablet. The questions asked were as follows:

- What did you like about the video?
- What did you not like about the video?
- What did you think about the animation?
- What information would you prefer to see in the video?
- Did you have any difficulty using the tablet?

The goal was 100% completion of all pre- and postintervention survey questions. MCIDs are changes in patient-reported scores reflective of a meaningful intervention and were used to report pre- and postintervention differences for each instrument (Johnston et al., 2015).

Data Collection and Analysis

Each participant was assigned a unique alphanumeric identifier for confidentiality. All participant demographic and survey results were entered into

REDCap. Data analysis was conducted using IBM SPSS Statistics, version 25.0. Descriptive statistics included means, SDs, medians, and ranges for continuous data, as well as frequencies and percentages for categorical data. Differences of pre- and postintervention scores from the RT Concerns

TABLE 1. Mean Responses on the RT Concerns Scale, PROMIS® Emotional Distress-Anxiety–Short Form 6a, and National Comprehensive Cancer Network Distress Thermometer

	Preintervention (N = 20)				Postintervention (N = 20)				Difference in Means		
Measure	$\bar{X}$	SD	M	Range	$\bar{X}$	SD	M	Range	$\bar{X}$	SD	95% CI
RT Concerns Scale											
Maintaining work activity during treatment	5.6	3.5	7	0–9	2.8	2.9	1	0–9	–2.8	3.1	[1.3, 4.3]
What would happen during treatment	7.5	2	8	2–9	3.4	3	2	1–9	4.1	3.2	[2.6, 5.6]
The possibility of skin reactions as a result of treatment	7.2	2.4	8	2–9	3.4	3	2	1–9	3.8	3.2	[2.3, 5.3]
The possibility of tiredness as a result of treatment	7.3	2.3	8	2–9	3.3	3	1.5	1–9	4	3.1	[2.6, 5.4]
The possibility of experiencing pain as a result of treatment	7.4	2.5	9	1–9	2.4	2.5	1	0–9	5	3	[3.5, 6.4]
The treatment machines	6.2	3	7	0–9	2.3	2.5	1	0–9	3.9	3.1	[2.5, 5.3]
Getting the information you required	7.1	2.5	8	1–9	3.2	3.3	1	1–9	4	4.1	[2, 5.9]
The impact of the treatment on your life	8.1	1.9	9	3–9	3.8	3.4	2	1–9	4.3	3.3	[2.7, 5.8]
The impact of the treatment on your health in the future	8	1.9	9	3–9	3.8	3.5	1.5	1–9	4.3	3.3	[2.7, 5.8]
Total score	64.2	15.7	68	18–81	28	24	12	8–76	36.2	23.5	[25.2, 47]
PROMIS Emotional Distress-Anxiety–Short Form 6a (raw scores; T-score used for total)											
I felt fearful.	2.7	1.7	2	1–5[a]	1.8	1.4	1	1–5	0.8	1.5	[0.1, 1.6]
I found it hard to focus on anything other than my anxiety.	2.2	1.2	2	1–5	1.6	1.1	1	1–5	0.7	1.3	[0, 1.3]
My worries overwhelmed me.	2.5	1.5	2	1–5	1.6	1.1	1	1–5	0.9	1.2	[0.3, 1.5]
I felt uneasy.	2.4	1.5	2	1–5	1.7	1.2	1	1–5	0.7	1.2	[0.1, 1.3]
I felt nervous.	2.9	1.3	3	1–5	1.7	0.9	1	1–4	1.2	1.3	[0.6, 1.8]
I felt like I needed help for my anxiety.	2	1.3	1.5	1–5	1.5	0.9	1	1–4	0.6	0.8	[0.2, 0.9]
Total T-score	57.2	12.4	56	39–82	47.7	11.5	39	39–74	9.5	4.8	[7.4, 11.6]
National Comprehensive Cancer Network Distress Thermometer											
Level of distress or anxiety about receiving RT	5.6	2.7	5	1–10[a]	2.3	2.5	1	0–8	3.3	3.3	[1.7, 4.8]

[a]N = 19
CI—confidence interval; M—median; PROMIS—Patient-Reported Outcomes Measurement Information System; RT—radiation therapy
Note. Based on information from Halkett & Kristjanson, 2007; Pilkonis et al., 2011.

Scale and the NCCN Distress Thermometer were calculated along with their 95% confidence intervals (CIs). T-scores were calculated for the PROMIS Emotional Distress-Anxiety–Short Form 6a using the online HealthMeasures Scoring Service (HealthMeasures, n.d.). Qualitative data collected from the postintervention questionnaire were entered into a Microsoft Excel spreadsheet and analyzed for common themes.

Results

The areas of evaluation as described by Tickle-Degnen (2013) and Thabane et al. (2010) were used for collecting feasibility data (processes, resources, management, and science).

Processes

All 20 individuals approached agreed to participate, and all participants completed the entire study; therefore, both benchmarks of enrollment and retention were exceeded. The benchmark of 100% completion of all survey questions was not met; however, only two missing values were identified. Table 1 details the results of the pre- and postintervention scores. Only one technology-related issue occurred during the study. During a passing storm, Internet connectivity was interrupted for a few minutes; one participant was viewing the video, which halted because of the lost Internet connection. This delayed the participant from viewing the video in its entirety the first time. After the interruption, the participant completed viewing the video.

Participant Characteristics

A total of 20 patients participated in this study, and although all participants were women, there was a mix of race, age, and disease staging criteria among participants. All participants were of non-Hispanic ethnicity (n = 20), 50% were White (n = 10) and 40% Black (n = 8), and 55% were aged older than 60 years. The stage of breast cancer reported was primarily stage I (40%) or stage III (50%). Nearly a third of participants had received systemic therapy (65%). Most appointments were initial consultations (65%) (see Table 2).

Resources

The PI, also a nurse case manager at the site, conducted the chart review to identify potential study candidates, administered the pre- and postintervention patient questionnaires on paper, and used a research site–issued tablet for showing the educational video to study participants. This allowed for minimal nurse case manager staffing resource allocation and avoidance of any equipment purchases for viewing the video. Both radiation oncologists reported no increase in time to the consultation visit as compared to previous consultation visits without video viewing. One radiation oncologist stated she felt as though her portion of the consultation was easier when describing RT specifics because she could refer procedures back to what was previously viewed in the video.

Management

The PI performed the data entry into REDCap, Excel, and SPSS. All patient questionnaires were kept in a secure and locked cabinet at the study site. Electronic data were stored in a password-protected file. Qualitative data collected from patients were transcribed and categorized by question for ease in theme identification.

Science

The two radiation oncologists who participated in the study completed AIM, FIM, and IAM. Total scores for each measure exceeded the authors' benchmark of 17 with a total score of 20 each, which is the greatest score value.

The mean total score for the preintervention RT Concerns Scale was 64.2 (SD = 15.7) and 28 (SD = 24) postintervention. The difference in means was 36.2 (SD = 23.5; 95% CI [25.2, 47]). The largest difference in means was seen with the item "the possibility of experiencing pain as a result of treatment" ($\bar{X}$ = 5, SD = 3; 95% CI [3.5, 6.4]). The question with the smallest difference in mean scores was "maintaining work activity during treatment" ($\bar{X}$ = 2.8, SD = 3.1; 95% CI [1.3, 4.3]).

The mean total T-score for the PROMIS Emotional Distress-Anxiety–Short Form 6a preintervention was 57.2 (SD = 12.4) and postintervention was 47.7 (SD = 11.5). The difference in mean T-scores was 9.5 (SD = 4.8; 95% CI [7.4, 11.6]). The greatest difference in mean raw scores occurred with the statement "I felt nervous" ($\bar{X}$ = 1.2, SD = 1.3; 95% CI [0.6, 1.8]). The least change in pre- and postintervention mean raw scores was the question "I felt like I needed help for my anxiety" ($\bar{X}$ = 0.6, SD = 0.8; 95% CI [0.2, 0.9]).

The mean total score for the NCCN Distress Thermometer was 5.6 (SD = 2.7) preintervention and 2.3 (SD = 2.5) postintervention. The difference in mean scores equated to 3.3 (SD = 3.3; 95% CI [1.7, 4.8]).

Participants provided qualitative data at the end of the postintervention survey. All comments were

manually entered into an Excel spreadsheet and organized by question, and content analysis was performed to identify common themes in responses to the five open-ended questions (Strauss & Corbin, 1990). The following three common themes were identified:

- The content was informative and in language that was easy to understand.
- The animation was accepted and liked.
- More detail was requested for side effects.

A sampling of the comments can be found in Table 3.

Discussion

Patients preparing for RT have reported high information needs (Hahn et al., 2005; Halkett et al., 2008, 2009, 2012, 2013, 2018; Harrison et al., 1999; Hess & Chen, 2014; Holtzman et al., 2018; Jahraus et al., 2002; Matsuyama et al., 2013). In addition, anxiety about RT is typically highest prior to the initial consultation (Halkett et al., 2008, 2009; Hess & Chen, 2014). Prior studies reported feelings of being unprepared for the RT experience (Hahn et al., 2005; Halkett et al., 2008, 2009, 2013, 2018; Hess & Chen, 2014; Matsuyama et al., 2013; Pembroke et al., 2020).

To date, one published study presented an educational video prior to the radiation oncology consultation visit with favorable results (Matsuyama et al., 2013). However, the findings could not be generalized to patients with breast cancer because of the small sample size (n = 23), the nonspecific target audience, the various anatomic sites treated, and the use of a nonvalidated instrument to evaluate RT knowledge (Matsuyama et al., 2013). Recent pilot studies explored the use of technology, creating a virtual reality experience for a select group of patients with cancer (Jimenez et al., 2018; Jimenez & Lewis, 2018a, 2018b; Marquess et al., 2017). One pilot study using a Virtual Environment Radiotherapy Training (VERT™) software package was conducted in the United States with patients diagnosed with prostate cancer (Marquess et al., 2017). The results were promising; however, the researchers did not use a validated data collection instrument to assess the video's efficacy. Jimenez et al. (2018) conducted a quasiexperimental VERT study in Australia with patients diagnosed with breast cancer and reported improvements in RT knowledge and patient anxiety; however, limitations included lack of randomization, small sample size, involvement of only one study site, and VERT conducted at a separate location away from the RT facility.

The current study assessed the feasibility and preliminary impact of an animated educational video shown during the RT consultation visit. The user-friendly websites Powtoon and Audacity eased video creation and editing. Recruitment and retention goals

TABLE 2. Sample Characteristics (N = 20)

Characteristic	n
Gender	
Female	20
Male	–
Race	
White	10
Black	8
Native Hawaiian/Pacific Islander	1
Ethiopian	1
Ethnicity	
Non-Hispanic or Latino	20
Age at appointment (years)	
40 or younger	2
41–49	4
50–59	3
60–69	7
70 or older	4
Type of appointment	
Consultation	13
Reevaluation	7
Cancer stage at appointment	
0 (ductal carcinoma in situ)	1
I	8
II	1
III	10
Surgery type	
Biopsy only	8
Lumpectomy	7
Unilateral mastectomy	5
Systemic therapy prior to RT appointment	
Chemotherapy	8
Endocrine therapy	4
Both	1
Neither	7
History of anxiety/depression	
Anxiety	6
Depression	1
Both	1
Neither	12

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were met (20 of 20 patients enrolled, watched the video, and completed the pre- and postintervention questionnaires), and the study was implemented as designed.

Results for the primary aim indicated that video viewing during the consultation visit is feasible. Both participating radiation oncologists scored the AIM, IAM, and FIM with a score of 20, which is the highest possible score. Comments from the physicians indicated that the video contributed to better baseline knowledge of RT for the participants. With a patient population diverse in race, age, and disease stage, comments indicated a very high level of satisfaction with the design and content contained in the video. Three participants commented on wanting more information regarding RT side effects, and incorporating this information in an easy-to-understand manner should be investigated further. This is a difficult area to address because numerous factors contribute to RT-related side effects, and side effects may vary between patients with breast cancer based on the prescribed treatment, which can range from one week of partial breast irradiation to a more than six-week course of RT including regional nodal irradiation.

Overall, patients diagnosed with cancer have an increased risk of experiencing anxiety, depression, or both (Holtzman et al., 2018). The three instruments chosen for the study's secondary aim directly relate to RT concerns, anxiety, and distress. The results from this aim are promising. The change in pre- and postintervention mean scores indicated that participants' anxiety, distress, and RT concerns decreased after watching the video. Although an MCID in scores was not achieved for the RT Concerns Scale, the difference in means can be considered clinically important, following general guidelines for using half of the SD (HealthMeasures, n.d.). Therefore, the difference in means for the RT Concerns Scale total score was calculated as 36.2 and is greater than half the SD of 11.8 (23.5/2). Using the same methodology for the NCCN Distress Thermometer, the difference in means for the total score was calculated at 3.3 and is greater than half the SD of 1.7 (3.3/2).

In terms of the PROMIS Emotional Distress-Anxiety–Short Form 6a scores, it is important to note that the baseline PROMIS anxiety T-score of 57.2 (SD = 12.4) is considerably higher than the general U.S. population and previously published cancer-specific reference values (Jensen et al., 2017). This suggests that the study participants were, on average, experiencing high levels of anxiety at the start of RT. The 9.5-point reduction in anxiety found in this study is also quite large. However, it is unclear whether this is because of real effects of the intervention or a transient high-level baseline. This study was not powered to explore this, and the findings suggest the need to conduct this intervention in a larger sample.

Assessing and addressing RT-related concerns, anxiety, and distress are fundamental in affording

TABLE 3. Sample Participant Responses to Qualitative Data

Open-Ended Question	Sample of Answers
What did you like about the video?	■ "I liked the tone. It was gentle in its delivery but not childish. Very informative but not overwhelming." ■ "Spoken in terms I could understand. Real-life photos." ■ "Gave some information I didn't know beforehand." ■ "The video was very informative; it left no questions unanswered."
What did you not like about the video?	■ "I liked everything."
What did you think of the animation?	■ "Very adult, focused, very simple, not cluttered." ■ "It was great." ■ "I loved it."
What information would you prefer to see?	■ "How does proton therapy work, and how is it different from photon therapy?" ■ "Some visual aids (like picture of a patient before, after, and during treatment)." ■ "More on side effects." ■ "Pictures of body before and after treatment."
Did you have any difficulty using the tablet?	■ "No." ■ "Tablet cut off midway through video. Nurse resolved issue and we were able to complete video."

patients with breast cancer a positive experience throughout treatment. The importance of associating the questions used in the educational video with the four domains of the Quality of Life Model Applied to Breast Cancer (Ferrell et al., 1998) was to educate this vulnerable population on some aspects related to physical well-being ("What are common side effects?"), psychological well-being ("How do I prepare for radiation treatment?"), social well-being ("Will I need to change my activities?" and "Am I radioactive?"), and spiritual well-being ("What is treatment like?") in an easy-to-understand, animated manner.

Piloting the use of this video during the RT consultation added to the existing research on when to educate patients about RT, how best to deliver the education, and the role of the oncology nurse in survivorship care and education. Several prior studies assessed the delivery of RT education after the initial consultation but did not address patients' high anxiety prior to the initial consultation (Halkett et al., 2008; Hess & Chen, 2014; Jahraus et al., 2002). The promising outcomes from this study are unique because they result from use of an animated video combined with validated instruments used for patient self-report of RT concerns, anxiety, and distress. It should be noted that embedding the video into the consultation visit did not lengthen the clinic visit or cause any clinic flow delays.

Limitations

This feasibility study used a single-arm, pre- and postintervention design to assess the possibility of including a short video during the RT consultation or reevaluation visit. A power analysis was not conducted, and there was no control group and no randomization; therefore, the authors are unable to interpret these results as an intervention effect on the outcomes. This feasibility study was not intended to be hypothesis-testing research, rather hypothesis-generating research aimed to stimulate future studies related to this work. In addition, the results are not generalizable and may vary with a larger randomized controlled trial. Baseline RT knowledge may have varied between participants scheduled for an initial consultation versus a reevaluation clinic visit. Other factors in addition to anxiety, distress, and RT needs may play a role in the impact of the intervention and were not measured during this study. Although not knowing about RT is one possible component of cancer-associated anxiety, there are many others, primarily regarding survival, which the video was not intended to address or abate. Therefore, the authors did not expect anxiety scores to go to zero. Results may have varied if additional sites had been included and the study had occurred over a longer time period. The version of Powtoon used had limited choices for animated characters; therefore, the diversity in appearance of the animated people was suboptimal. Future versions of this work should ensure use of an animation tool that allows greater expression of personal characteristics.

KNOWLEDGE TRANSLATION

- Brief educational videos delivered during times of high patient anxiety may enhance the treatment experience for patients.
- Treatment experience education delivered prior to a consultation visit may streamline the physician visit.
- Video education offers a means to standardize patient education across all providers.

Implications for Practice

In this pilot study, feasibility was achieved and preliminary findings reported a change in scores for anxiety, distress, and RT concerns as measured by three validated scales. Future efforts may consider additional feasibility studies using video education throughout each stage of cancer survivorship. Next steps include content validity of the video; a larger, adequately powered study to determine if the video was effective in reducing quality-of-life measures (e.g., anxiety, distress, RT concerns); and further cost analysis of video creation for additional anatomic sites.

This study reported excellent acceptability results from a nurse-designed and -led intervention, supporting expanding the role of the oncology nurse. Tailored, brief educational videos can contribute to promoting a culture of patient empowerment by improving cancer knowledge and treatment-related symptom self-management. Further research is warranted to evaluate and substantiate outcomes.

Conclusion

This intervention combined an animated educational video with existing verbal and written didactic information delivered during the RT consultation. Administering the video during the consultation is feasible and can potentially provide for a more efficient consultation visit by increasing the patient's

baseline RT knowledge and decrease RT-related concerns, distress, and anxiety. This educational video may help to create a new standard for patient education in RT care.

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QUESTION GUIDE FOR A JOURNAL CLUB

Journal clubs can help to increase and translate findings to clinical practice, education, administration, and research. Use the following questions to start discussion at your next journal club meeting. Then, take time to recap the discussion and make plans to proceed with suggested strategies.

1. Discuss common mental health symptoms experienced by women with breast cancer during radiation therapy.
2. What are the benefits and drawbacks of using educational videos in the clinical setting?
3. Do you think that breast radiation therapy video education would be feasible in your clinical setting? If not, what are the perceived issues and strategies for enhancing self-directed symptom management modalities?

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